Commonwealth of Kentucky
Division for Air Quality

STATEMENT OF BASIS / SUMMARY

Title V, Operating
Permit: V-21-004
Stein, Inc.
69 Armco Road
Ashland, KY 41101
4/29/2021
Babak Fakharpour, Reviewer

SOURCE ID:	21-019-00107
AGENCY INTEREST:	37297
ACTIVITY:	APE20190001

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SECTION 1 – SOURCE DESCRIPTION

SIC Code and description: 3295, Minerals and Earths, Ground or Otherwise Treated (grinding, washing, separating, etc. of nonmetallic minerals, nec)
Single Source Det. ☒ Yes ☐ No If Yes, Affiliated Source AI: 307

Source-wide Limit ☐ Yes ☒ No If Yes, See Section 4, Table A

28 Source Category ☒ Yes ☐ No If Yes, Category: Iron and steel mills

County: Boyd
Nonattainment Area ☒ N/A ☐ PM_{10} ☐ $PM_{2.5}$ ☐ CO ☐ NO_X ☐ SO_2 ☐ Ozone ☐ Lead

PTE* greater than 100 tpy for any criteria air pollutant ☐ Yes ☒ No
If yes, for what pollutant(s)?
☐ PM_{10} ☐ $PM_{2.5}$ ☐ CO ☐ NO_X ☐ SO_2 ☐ VOC

PTE* greater than 250 tpy for any criteria air pollutant ☐ Yes ☒ No
If yes, for what pollutant(s)?
☐ PM_{10} ☐ $PM_{2.5}$ ☐ CO ☐ NO_X ☐ SO_2 ☐ VOC

PTE* greater than 10 tpy for any single hazardous air pollutant (HAP) ☐ Yes ☒ No
If yes, list which pollutant(s):

PTE* greater than 25 tpy for combined HAP ☐ Yes ☒ No

*PTE does not include self-imposed emission limitations.

*PTE does not include potential emissions from the co-located Cleveland-Cliffs Steel Corporation-Ashland Works (Old A.K. Steel) facility.

Description of Facility:
Stein, Inc. is a slag processing plant that supports Cleveland-Cliffs Steel Corporation-Ashland Works in Ashland, Kentucky. Stein, Inc. is located on property within the Cleveland-Cliffs Steel Corporation site. Due to this, the Division and the U.S. EPA consider Stein and Cleveland-Cliffs Steel Corporation to be one source as defined in 401 KAR 51:017, Prevention of significant deterioration of air quality (PSD). Pursuant to the respective Title V permits, each permittee is responsible and liable for their own violations unless there is a joint cause for the violations.

Stein, Inc. processes two types of slag at their plant in Ashland, Kentucky. The slag types are Basic Oxygen Furnace (BOF) slag which is a by-product of the BOF steel making operation, and the second type of slag is Blast Furnace (BF) slag which is by-product of the BF iron making operation. BOF slag is the main product processed at their "Main Plant". Stein's "Mid-West Plant" is a screening plant on site. Material that is taken to this location is mostly clean up (refuse materials) from the BOF shop.

Stein, Inc. is also responsible for digging the BF slag pit. However, this emission point is permitted in the Cleveland-Cliffs Steel Corporation Title V permit (EP 50). The unprocessed BF slag gets loaded into trucks and is transported and processed off-site from the Cleveland-Cliffs Steel Corporation plant.

Oxygen lance pipes are used to cut large pieces of mild steel scrap into smaller, more easily handled pieces. The oxygen lance pipe process involve the use of oxygen as the fuel to cut ferrous scrap material.

SECTION 2 – CURRENT APPLICATION AND EMISSION SUMMARY FORM

Permit Number: V-21-004 Activities: APE20190001

Received: April 17, 2019 Application Complete Date(s): July 23, 2019

Permit Action: ☐ Initial ☒ Renewal ☐ Significant Rev ☐ Minor Rev ☐ Administrative

Construction/Modification Requested? ☐Yes ☒No NSR Applicable? ☐Yes ☒No

Previous 502(b)(10) or Off-Permit Changes incorporated with this permit action ☐Yes ☒No

Description of Action:
The Division received an application from Stein, Inc. for the renewal of the existing Title V permit.

The changes made to the permit as a result of the renewal process are as follows:
- The 401 KAR 63:010 regulatory language was updated to reflect recent regulation changes.
- The permit language was updated to be consistent and clear.

Note: The facility has not operated since 2018 because the co-located source, Cleveland-Cliffs Steel Corporation, has been shut down.

Pollutant	2020 Actual (tpy)	Revised PTE V-21-004 (tpy)
CO	0	0
NO_X	0	0
PT	0	123
PM_{10}	0	43
$PM_{2.5}$	0	10
SO_2	0	0
VOC	0	0
Lead	0	0
Greenhouse Gases (GHGs)		
Carbon Dioxide	0	0
Methane	0	0
Nitrous Oxide	0	0
CO_2 Equivalent (CO_2e)	0	0
Hazardous Air Pollutants (HAPs)		
Manganese	0	0.53
Combined HAPs:	0	1.12

Note: This table does not include potential emissions from the co-located AK Steel facility.

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS

Emission Points 01 through 24					
Pollutant	**Emission Limit or Standard**		**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
PM_{10}	EP 24	7.9 ton/yr	To preclude 401 KAR 51:017	0.5 lb/ton for PM_{10}; AP-42, Section 12.5	Monthly calculations; monitoring; recordkeeping

Initial Construction: EP 1 through EP 22 (2000), EP 23 (2001), and EP 24 (2004)

Process Description:
BOF slag is the main product processed at the "Main Plant" (EPs 1-13).

Emission Point #	Unit Name	Maximum Capacity (tons/hr)	Control Device	Construction Commenced
01	Grizzly	300	None	2000
02	Conveyor #1 - 42" Conveyor	340	None	2000
03	Crusher	40	None	2000
04	Conveyor #2 - 30" Conveyor	60	None	2000
05	Conveyor #3 - 36" Conveyor	25	None	2000
06	5 x 12 DD Screen	60	None	2000
07	Conveyor # 4 - 42" Conveyor	20	None	2000
08	Conveyor # 5 - 36" Conveyor	20	None	2000
09	Conveyor # 6 - 36" Conveyor	280	None	2000
10	5 x 12 DD Screen	280	None	2000
11	Conveyor # 7 - 30" Conveyor	40	None	2000
12	Conveyor # 8 - 42" Conveyor	140	None	2000
13	Conveyor # 9 - 30" Conveyor	140	None	2000

The Slag-a-Way pot trucks (owned by Cleveland-Cliffs Steel Corporation) transports the slag and removes the skulls from the pot. The slag is dumped into cooling pits where it is allowed to cool for up to 24 hours. The slag is then quenched by water sprays. The cooled slag is then dug out by a front end loader and is transported to a raw slag pile for future processing. Slag storage piles (2) are located at the slag processing plant, one pile contains material less than ¾ inch and the second pile contains ¾ inch to 3 inches. A front-end loader is used to feed the material into the vibrating grizzly hopper which then is sent through a crusher. After the crusher, material is moved through a sequence of conveyor belts. The "Main Plant" has a series of two double deck screens (5'x12') for processing. After each screening the sized slag comes off on side conveyors to temporary storage piles.

Emission Points 01 through 24

Stein's "Mid-West Plant" (EPs 14-20) is a screening plant on site.

Emission Point #	Unit Name	Maximum Capacity (tons/hr)	Control Device	Construction Commenced
14	6 x 16 TD Screen	140	Water spray	2000
15	Conveyor # 10 - 42" Conveyor	32	Water spray	2000
16	Conveyor # 11 - 30" Conveyor	100	Water spray	2000
17	Conveyor # 12 - 24" Conveyor	32	Water spray	2000
18	Conveyor # 13 - 24" Conveyor	48	Water spray	2000
19	Conveyor # 14 - 36" Conveyor	60	Water spray	2000
20	Haul Roads (Area 1)	NA	Water spray	2000
21	Front End loader (Batch Drop)	300	Water spray	2000
22	Raw Slag Trucks and Customer Trucks (Area 2)	NA	Water spray	2000
23	Hopper/Feeder	300	Water spray	2001
24	Oxygen Lance Cutters	12	Water mister	2004

Material that is taken to this location is mostly clean up (refuse materials) from the BOF shop. The plant has a grizzly with 6-inch finger type openings. All material coming off the grizzly gets magged over a head pulley magnet. The iron material goes to a two deck screen and the rest of the scrap is divided according to size into 3 different piles. Oxygen lance pipes are used to cut large pieces of mild steel scrap into smaller, more easily handled pieces. The oxygen lance pipe process will involve the use of oxygen as the fuel to cut ferrous scrap material.

Applicable Regulations:
401 KAR 63:010, *Fugitive emissions,* applicable to each of the affected facilities listed above.

401 KAR 63:020, *Potentially hazardous matter or toxic substances,* applies to each affected facility which emits or may emit potentially hazardous matter or toxic substances, provided such emissions are not elsewhere subject to the provisions of the administrative regulations of the Division for Air Quality. Applies to EP 24.

Precluded Regulations:
401 KAR 51:017, *Prevention of significant deterioration of air quality*, for EP 24

Comments:
The particulate emissions from the conveyors and screens are controlled by water suppression sprays and high moisture content. Water spray (control efficiency of 80%) is used for transport of raw slag. The emissions from haul roads (unpaved) are controlled by water spray with a control efficiency of 80%.

For EP 24, emission factors of 1.0 lb/ton for PM and 0.5 lb/ton PM_{10} are used for torch cutting of oversized slag and skulls. Assuming 10 times more emissions are generated cutting contaminated scrap (skulls) than clean metal. Pressurized oxygen lances propel pockets of contaminated materials airborne. Multiplied 0.1 lb PM/ton machine scarfing, from AP-42, Chapter Section 12.5 (Iron & Steel Production), Fifth Edition, by 10. It was assumed that PM_{10} equals half of the PM. Stein, Inc. requested to use a water mister unit as a control measure at all times when torch cutting oversized slag and skulls. This work practice standard limits PM and PM_{10} emissions from the oxygen lance pipes below the levels that would trigger PSD applicability.

Emission Points 01 through 24
Water mister control efficiency of 70% is assumed. HAP emissions calculated using AK Steel MSDS for Cold Rolled Steel (October 7, 2005).

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS (CONTINUED)

Testing Requirements\Results
N/A

Footnotes: The source, at the time of renewal V-21-004, has not been required to perform any testing.

SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS

Table A - Group Requirements:
N/A

Table B - Summary of Applicable Regulations:

Applicable Regulations	Emission Point
401 KAR 63:010, *Fugitive emissions,* applies to each apparatus, operation, or road which emits or may emit fugitive emissions provided that the fugitive emissions from such facility are not elsewhere subject to an opacity standard within the administrative regulations of the Division for Air Quality.	EP 01 -EP 24
401 KAR 63:020, *Potentially hazardous matter or toxic substances.*	EP 24

Table C - Summary of Precluded Regulations:

Precluded Regulations	Emission Point
401 KAR 51:017, *Prevention of significant deterioration of air quality,* applies to the construction of a new stationary source or a major modification of an existing major stationary source. Since the facility is part of Cleveland-Cliffs Steel Corporation (AI 307), it is considered part of a major source under 401 KAR 51:017, *Prevention of significant deterioration* (PSD), and any emissions increases at Stein, Inc. must be compared to the Significant Emissions Rates (SERs) for 401 KAR 51:017 to determine if a project would constitute a major stationary source or major modification subject to PSD (401 KAR 51:017, Sections 8-14). It is because of this determination that the source requested emission limitations on EP 24 such that the SERs would not be exceeded.	EP 24

Table D - Summary of Non Applicable Regulations:
N/A

Air Toxic Analysis
401 KAR 63:020, *Potentially Hazardous Matter or Toxic Substances*
The Division for Air Quality (Division) has performed AERMOD on April 9 , 2021 of potentially hazardous matter or toxic substances (Aluminum, Boron, Manganese, Molybdenum, Nickle, Vanadium) that may be emitted by the facility based upon the process rates, material formulations, stack heights and other pertinent information provided in the application and supplemental information submitted by the source. Based upon this information, the Division has determined that the conditions outlined in this permit will assure compliance with the requirements of 401 KAR 63:020.

SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS (CONTINUED)

Single Source Determination

The primary steel mill, Cleveland-Cliffs Steel Corporation – Ashland Works, Source ID #: 21-019-00005 (A.I. #307), and the co-located slag processing plant, Stein, Inc., Source ID #: 21-019-00107 (A.I. #37297), are considered by the Kentucky Division for Air Quality and the U.S. EPA Region IV to be one source as defined in 401 KAR 51:017, Prevention of significant deterioration of air quality (PSD). Each source is subject to 401 KAR 52:020 and will be issued individual Title V operating permits. Pursuant to the respective Title V permits, each permittee is responsible and liable for their own violations unless there is a joint cause for the violations.

SECTION 5 – PERMITTING HISTORY

Permit	Permit type	Activity#	Complete Date	Issuance Date	Summary of Action	PSD/Syn Minor
V-05-061	Initial	APE20050002	9/9/05	4/19/07	Initial Construction Permit	N/A
V-13-037	Renewal	APE20110001	10/11/13	2/25/15	Renewal	Syn Minor
V-21-004	Renewal	APE20190001	7/23/2019	---	Renewal	N/A

SECTION 6 – PERMIT APPLICATION HISTORY

None

APPENDIX A – ABBREVIATIONS AND ACRONYMS

AAQS – Ambient Air Quality Standards
BACT – Best Available Control Technology
Btu – British thermal unit
CAM – Compliance Assurance Monitoring
CO – Carbon Monoxide
Division – Kentucky Division for Air Quality
ESP – Electrostatic Precipitator
GHG – Greenhouse Gas
HAP – Hazardous Air Pollutant
HF – Hydrogen Fluoride (Gaseous)
MSDS – Material Safety Data Sheets
mmHg – Millimeter of mercury column height
NAAQS – National Ambient Air Quality Standards
NESHAP – National Emissions Standards for Hazardous Air Pollutants
NO_x – Nitrogen Oxides
NSR – New Source Review
PM – Particulate Matter
PM_{10} – Particulate Matter equal to or smaller than 10 micrometers
$PM_{2.5}$ – Particulate Matter equal to or smaller than 2.5 micrometers
PSD – Prevention of Significant Deterioration
PTE – Potential to Emit
SO_2 – Sulfur Dioxide
TF – Total Fluoride (Particulate & Gaseous)
VOC – Volatile Organic Compounds